

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
30 September 2004 (30.09.2004)

PCT

(10) International Publication Number  
**WO 2004/083594 A3**

(51) International Patent Classification<sup>7</sup>: **E21B 23/00,**  
43/10

[US/US]; 19115 Prospect Ridge Lane, Houston, TX 77094  
(US). COSTA, Scott [US/US]; 2011 Willow Point, King-  
wood, TX 77330 (US).

(21) International Application Number:  
PCT/US2004/008171

(74) Agent: **MATTINGLY, Todd;** Haynes and Boone, LLP,  
901 Main Street, Suite 3100, Dallas, TX 75202 (US).

(22) International Filing Date: 15 March 2004 (15.03.2004)

(81) Designated States (*unless otherwise indicated, for every  
kind of national protection available*): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,  
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,  
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,  
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,  
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,  
ZW.

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/454,896 14 March 2003 (14.03.2003) US

(71) Applicant (*for all designated States except US*): **ENVEN-  
TURE GLOBAL TECHNOLOGY** [US/US]; 16200 A  
Park Row, Houston, TX 77084 (US).

(84) Designated States (*unless otherwise indicated, for every  
kind of regional protection available*): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),

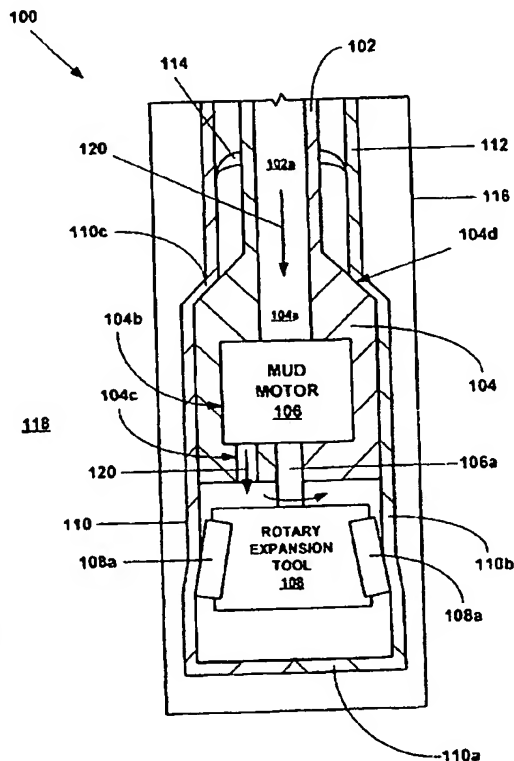
(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **SHUSTER, Mark**

[Continued on next page]

(54) Title: APPARATUS AND METHOD RADIALY EXPANDING A WELLBORE CASING USING AN EXPANSION MAN-  
DREL AND A ROTARY EXPANSION TOOL

(57) Abstract: An apparatus and method for radially expanding a wellbore casing (112) using an expansion mandrel (104) and a rotary expansion tool (108).



BEST AVAILABLE COPY

WO 2004/083594 A3



Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**

— with international search report

(88) Date of publication of the international search report:  
19 May 2005

**Declaration under Rule 4.17:**

— of inventorship (Rule 4.17(iv)) for US only

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/08171

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : E21B 23/00, 43/10

US CL : 166/380, 382, 207

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 166/380, 382, 207, 206

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3,785,193 A (KINLEY et al) 15 January 1974 (15/01/1974), Figures 1-3.	2, 4-6 and 8-15
X	US 2,627,891 A (CLARK) 10 February 1953 (10/02/1953), Figures 1 and 4.	2, 4-6 and 8-15
A, P	US 6,543,552 A (METCALFE et al) 08 April 2003 (08/04/2003), Figures 1-7.	1-15
A	US 3,818,734 A (BATEMAN) 25 June 1974 (25/06/1974), see Figure 1.	1-15
A	US 2003/0024711 A1 (SIMPSON et al) 06 February 2003 (06/02/2003), Figure 2	1-15



Further documents are listed in the continuation of Box C.



See patent family annex.

Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

11 January 2005 (11.01.2005)

Date of mailing of the international search report

16 FEB 2005

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Facsimile No. (703) 305-3230

Authorized officer

Hoang Dang

Telephone No. 703-308-2168

Form PCT/ISA/210 (second sheet) (January 2004)

BEST AVAILABLE COPY